



DEPARTMENT OF TRANSPORTATION

MATERIALS TRANSPORTATION BUREAU

WASHINGTON, D.C. 20590

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Title 49—Transportation

CHAPTER I—MATERIALS TRANSPORTATION BUREAU, DEPARTMENT OF TRANSPORTATION

[Docket No. HM-151, Amdt. Nos. 171-36, 172-37]

PART 171—GENERAL INFORMATION, REGULATIONS, AND DEFINITIONS

PART 172—HAZARDOUS MATERIALS TABLE AND HAZARDOUS MATERIALS COMMUNICATIONS REGULATIONS

Label and Placard Colors; Hazard Numbers
AGENCY: Materials Transportation Bureau, DOT.

ACTION: Final rule.

SUMMARY: This rule restates requirements applicable to colors specified for labels and placards used in transportation of hazardous materials, suspends for two years certain of those requirements from application to labels printed directly onto the surfaces of packagings (containers), and restates the allowable size of hazard numbers permitted to appear on labels.

Existing standards prescribing colors required to appear on hazardous materials warning labels and placards are numeric descriptions (Munsell notations) which are not well suited for use by shippers and carriers or by DOT field enforcement personnel. Restatement of those standards is intended to establish the use of color charts, displaying the colors represented by those numeric descriptions, as the basis for evaluating compliance.

The quality of colors printed on the various materials used to manufacture boxes, bags and other packagings have proved difficult to control, because of the printing processes which must be used and the porosity and pigmentation of such surfaces. A two-year suspension of the color standards for labels printed directly onto packagings is intended to provide a period of time during which adjustments to printing techniques and the standards themselves may be considered.

The existing limitation of the size of hazard numbers permitted on labels is an approximate standard which is difficult to enforce and which provides little guidance to those wishing to display them. The standard is being restated to establish a maximum allowable size.

DATES: The provisions of this rule are effective on July 5, 1977.

FOR FURTHER INFORMATION CONTACT:

Alan I. Roberts, Director, Office of Hazardous Materials Operations, 2100 Second Street SW., Washington, D.C. 20590 (phone: 202-426-0656).

SUPPLEMENTARY INFORMATION: A color standard for label and placard colors was published as a final rule under Docket No. HM-103, 112 on April 15,

1976 (41 FR 15972), compliance with which became mandatory on January 1, 1977.

This standard, proposed in 1974 under Docket No. HM-103 (39 FR 3164, January 24, 1974), involved two series of color charts provided by DOT that display standard colors. The colors on the charts are also numerically described in Appendix A to Part 172 by certain technical specifications (Munsell notations). The visual display on each chart incorporates a degree of latitude, or tolerance, to account for variations in printing materials and processes and was intended to serve as a visual control on label and placard colors, while the Munsell notations were provided to ensure constancy and reproducibility of the Color Tolerance Charts.

However, the manner in which §§ 172.407(d), 172.519(e) and Appendix A to Part 172 are stated makes it appear that the regulatory standard is the Munsell description rather than the visual display on the Color Tolerance Charts. Use of the numeric Munsell description as a standard could necessitate an instrumented examination of label and placard colors, relegating the Color Tolerance Charts to serving as a visual representation of the specified Munsell descriptors. Since an instrumented color analysis is beyond the practical capacity of many label, placard and packaging manufacturers, and many if not most shippers, some correction to the published standard is required. Moreover, field inspections such as those conducted by the Bureau of Motor Carrier Safety, as a practical matter, cannot include color instrumentation. Inspectors will use the Color Tolerance Charts and judge compliance by visual comparison between those charts and label and placard colors.

Accordingly, this rulemaking restates the color standard to establish as the controlling standard the colors displayed on the Color Tolerance Charts. The Munsell notations, a technical description, have been retained in Appendix A to Part 172 to ensure accurate reproduction of the charts. In this restatement, the weathering and fadeometer tests have been withdrawn from Appendix A and placed in §§ 172.407 and 172.519. As applicable to labels, the weathering test has been modified to take into account the practical limitations of packaging materials upon which labels are affixed or printed. Also, advisory references to two standards adopted by the American Society for Testing and Materials are included to illustrate what is meant by the fadeometer test requirement. Any fadeometer test that is a recognized standard procedure may be used, and either a wet or dry method may be selected. Appendix A is restated for clarity in its entirety, but the Munsell notations are themselves unchanged. Changes appear only in heading, footnotes, and the format of the Chroma column in Table 1.

A limited exception to the required use

of the Color Tolerance Charts has been included for labels printed before March 1, 1979, directly onto the surface of packagings. The costs and technical problems of printing with close color tolerances on packaging surfaces such as fiberboard, which may be both porous and pigmented, will require further evaluation. The Office of Hazardous Materials Operations will publish a notice outlining in some detail the factors bearing on a possible resolution and soliciting public comment.

As an additional matter, the MTB, acting on a petition concerning § 172.407(g)(3), is amending that provision. Section 172.407(g) allows the United Nations and Intergovernmental Maritime Consultative Organization hazard class number to be displayed in the lower corner of a label, but the number "must be . . . [a]pproximately 0.25-inch (6.3 mm.) high." That requirement, in § 172.407(g)(3), is too vague to be useful. Labels have sufficient space to allow display of a hazard number up to one-half inch (12.7 mm.) in size, and § 172.407(g)(3) is being amended to reflect more accurately that practical limitation.

This change is a relaxation of existing requirements and is not expected to impose any additional costs or burdens on the public, industry or government, or to have any significant environmental or economic impact. In view of that, and because the existing mandatory standards may be causing unnecessary compliance difficulties at the present time, public notice and comment are being dispensed herewith and the change is being made effective in less than 30 days after publication in the *FEDERAL REGISTER*.

Primary drafters of this document are Joseph T. Horning and Chris Caseman, Office of Hazardous Materials Operations, Regulations Development Branch, and Douglas A. Crockett, Office of the Assistant General Counsel for Materials Transportation Law.

In view of the foregoing, Parts 171 and 172 of Title 49, Code of Federal Regulations, are amended as follows:

1. In § 171.7, paragraphs (d)(5)(iv) and (v) are added to read as follows:

§ 171.7 Matter incorporated by reference.

(d) * * *

(5) * * *

(iv) ASTM G 23-69¹ is titled, "Standard Recommended Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Nonmetallic Materials," 1969 edition (re-approved 1975).

(v) ASTM G 26-70¹ is titled, "Standard Recommended Practice for Operating Light- and Water-Exposure Apparatus (Xenon-Arc Type) for Exposure of Nonmetallic Materials," 1970 edition.

2. In § 172.407, paragraphs (a), (d) and (g) (3) are revised to read as follows:

§ 172.407 Label specifications.

(a) Each label, affixed to or printed on a package must be durable and weather resistant. Black and any color on a label must be able to withstand, without substantial change—

(1) A 72-hour fadeometer test (for a description of equipment designed for this purpose, see ASTM G 23-69 (1975), or ASTM G 26-70); and

(2) A 30-day exposure to conditions incident to transportation that reasonably could be expected to be encountered by the labeled package.

(d) A color on a label, upon visual examination, must fall within the color tolerances displayed on the appropriate Office of Hazardous Materials Label and Placard Color Tolerance Chart.

(1) A set of six charts, dated January 1973, for comparison with labels and placards surfaced with paint, lacquer, enamel, plastic or other opaque coatings, or ink, may be purchased from the Office of Hazardous Materials Operations, U.S. Department of Transportation, Washington, D.C. 20590, for \$5.50.

(2) A set of six charts, dated January 1974, for comparison with labels and placards surfaced with ink, may be similarly purchased for \$12.50.

(3) Both sets of charts may be inspected in Room 6500, Office of Hazardous Materials Operations, 2100 Second Street, SW., Washington, D.C. 20590, or any of the offices of the Federal Highway

¹ Available from American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103.

Administration listed at 49 CFR 390.40.

(4) The technical specifications for each chart are set forth in Appendix A to this Part.

(5) The requirements of paragraph (d) of this section do not apply to labels printed directly onto the surface of a packaging before March 1, 1979: *Provided*, The colors of such labels comply with the appropriate colors described in §§ 172.411 through 172.450. To the extent possible, the colors of such labels should meet the requirements of paragraph (d) of this section.

(g) * * *

(3) One-half inch (12.7 mm.) or less in height.

*3. In § 172.519, paragraph (e) is revised to read as follows:

§ 172.519 General specifications for placards.

(e) Surface pigmentation on a placard must meet the following requirements.

(1) Black and any color must be able to withstand, without substantial change—

(i) A 72-hour fadeometer test (for a description of equipment designed for this purpose, see ASTM G 23-69 (1975), or ASTM G 26-70); and

(ii) A 30-day exposure to open weather conditions.

(2) A color on a placard, upon visual examination, must fall within the color tolerances displayed on the appropriate Office of Hazardous Materials Label and Placard Color Tolerance Chart (see § 172.407(d)).

4. Appendix A to Part 172 is revised to read as follows:

APPENDIX A—OFFICE OF HAZARDOUS MATERIALS OPERATIONS COLOR TOLERANCE CHARTS

The following are Munsell notations which describe the Office of Hazardous Materials Label and Placard Color Tolerance Charts. Central colors and tolerances described in Table 2 approximate those described in Table 1 while allowing for differences in production methods and materials used to manufacture labels and placards surfaced with printing inks. Color charts based on Table 2 are intended for use only with labels and placards surfaced with inks.

TABLE 1 - Specifications for Color Tolerance Charts for use with labels and placards surfaced with paint, lacquer, enamel, plastic or other opaque coatings, or ink.

| Color | Central | Tolerances | | | | | |
|--------|--------------|------------|----------|------------|------------|----------------|-------------------|
| | | Hue + | Hue - | Value + | Value - | Chroma 1/ + | Chroma 2/ - -- |
| Red | 7.5R 4.0/14 | 8.5R | 6.5R | 4.5/ | 3.5/ | /16 | /12 |
| Orange | 5.0YR 6.0/15 | 6.25YR | 3.75YR | 6.5/ | 5.5/ | /16 | /13 |
| Yellow | 5.0Y 8.0/12 | 6.5Y | 3.5Y | 8.5/ | 7.5/ | /14 | /10 |
| Green | 7.5G 4.0/9 | 0.5BG | 5.0G | 4.5/ | 3.5/ | /11 | /7 /6 |
| Blue | 2.5PB 3.5/10 | 4.5PB | 10.0B | 4.0/ | 3.0/ | /12 | /8 |
| Purple | 10.0P 4.5/10 | 2.5RP | 7.5P | 5.0/ | 4.0/ | /12 | /8 /6.5 |

1/ Maximum chroma is not limited.

2/ For the colors green and purple, the minimum saturation (chroma) limits for porcelain enamel on metal are lower than for most other surface coatings. Therefore, the minimum chroma limits of these two colors as displayed on the Charts for comparison to porcelain enamel on metal is low, as shown in the chroma double minus column.

TABLE 2 - Specifications for Color Tolerance Charts for use with labels and placards surfaced with ink.

| Color | Series | Munsell notation | Color | Series | Munsell notation |
|---------------------------|-----------------------|------------------|-----------------|-----------------|------------------|
| Orange - Continued | | | | | |
| Light series | Central color | 6.8R 4.47/12.8 | Light series | Light and vivid | 5.8YR 6.78/12.7 |
| | Grayish | 7.2R 4.72/12.2 | A. | | |
| | Purple | 6.4R 4.49/12.7 | Light and | | 6.0YR 6.80/12.8 |
| | Purple and vivid. | 6.1R 4.33/13.1 | yellow. | | |
| | Vivid | 6.7R 4.29/13.2 | Light and vivid | | 4.9YR 6.60/12.9 |
| | Orange | 7.3R 4.47/12.8 | B. | | |
| | Orange and grayish. | 7.65R 4.70/12.4 | Dark series | Dark and | 5.8YR 5.98/11.0 |
| | Light | 7.0R 4.72/13.2 | yellow. | | |
| | Light and | 7.4R 4.96/12.6 | Dark A | | 5.1YR 5.80/11.1 |
| | orange. | 6.6R 4.79/12.9 | Dark B | | 5.0YR 5.79/11.0 |
| Dark series | Light and purple | | Yellow: | | |
| | Dark A | 6.7R 4.19/12.5 | Central series | Central color | 4.3Y 7.87/10.3 |
| | Dark B | 7.0R 4.25/12.35 | Vivid A | | 4.5Y 7.82/10.8 |
| | Dark and | 7.5R 4.23/12.4 | Vivid B | | 3.3Y 7.72/11.35 |
| | purple. | | Vivid and | | 3.2Y 7.72/10.8 |
| Orange. | | | | | |
| Orange: | Central series | Central color | Grayish A | | 4.1Y 7.95/9.7 |
| | Yellow and grayish A. | 5.0YR 6.10/12.15 | Grayish B | | 5.1Y 8.06/9.05 |
| | Yellow and grayish B. | 5.8YR 6.22/11.7 | Green-yellow | | 5.2Y 7.97/9.9 |
| | Vivid | 6.1YR 6.26/11.85 | Light series | Light | 5.4Y 8.59/10.5 |
| | Red and vivid A. | 3.9YR 5.87/12.75 | Light and | | 5.4Y 8.56/11.2 |
| | Red and vivid B. | 3.6YR 5.91/12.6 | green-yellow. | | |
| | Grayish | 4.9YR 6.10/11.9 | Light and vivid | | 4.4Y 8.45/11.4 |
| | | | Dark and | | 4.4Y 7.57/9.7 |
| | | | Green-yellow | | |
| | | | Dark and | | 3.4Y 7.39/10.4 |
| | | orange A. | | | |
| | | Dark and | | 3.5Y 7.41/10.0 | |
| | | orange B. | | | |

| Color | Series | Munsell notation |
|-------------------------|-----------------|------------------|
| Green: | | |
| Central series | | |
| | Central color | 9.7G 4.26/7.75 |
| | Grayish | 10G 4.46/7.5 |
| | Blue A | 1.4BG 4.20/7.4 |
| | Blue B | 1.0BG 4.09/7.75 |
| | Vivid | 8.4G 4.09/8.05 |
| | Vivid green | 7.0G 4.23/8.0 |
| | yellow. | |
| | Green-yellow | 7.85G 4.46/7.7 |
| Light series | | |
| | Light and vivid | 9.5G 4.45/8.8 |
| | Light and blue | 0.2G 4.31/8.8 |
| | Light and | 8.3G 4.29/9.05 |
| | green-yellow. | |
| Dark series | | |
| | Dark and | 7.1G 4.08/7.1 |
| | green-yellow. | |
| | Dark and | 9.5G 4.11/6.9 |
| | grayish. | |
| | Dark | 8.5G 3.97/7.2 |
| Blue: | | |
| Central series | | |
| | Central color | 3.5PB 3.94/9.7 |
| | Green and | 2.0PB 4.35/8.7 |
| | grayish A. | |
| | Green and | 1.7PB 4.22/9.0 |
| | grayish B. | |
| | Vivid | 2.9PB 3.81/9.7 |
| | Purple and | 4.7PB 3.53/10.0 |
| | vivid A. | |
| | Purple and | 4.0PB 3.71/9.9 |
| | vivid B. | |
| | Grayish | 3.75PB 4.03/9.1 |
| Blue - Continued | | |
| Light series | | |
| | Light and | 1.7PB 4.32/9.2 |
| | green A. | |
| | Light and | 1.5PB 4.11/9.6 |
| | green B. | |
| | Light and vivid | 3.2PB 3.95/10.05 |
| | Dark and | 3.9PB 4.01/8.7 |
| Dark series | | |
| | Dark and | grayish. |
| | Dark and | 4.8PB 3.67/9.3 |
| | purple A. | |
| | Dark and | 5.2PB 3.80/9.05 |
| | purple B. | |
| Purple: | | |
| Central series | | |
| | Central color | 9.5P 4.71/11.3 |
| | Red | 1.0RP 5.31/10.8 |
| | Red and | 1.4RP 5.00/11.9 |
| | vivid A. | |
| | Red and | 0.2RP 4.39/12.5 |
| | vivid B. | |
| | Vivid | 8.0P 4.04/12.0 |
| | Blue | 7.0P 4.39/10.8 |
| | Grayish | 8.8P 5.00/10.3 |
| Light series | | |
| | Light and | 0.85RP 5.56/11.1 |
| | red A. | |
| | Light and | 1.1RP 5.27/12.3 |
| | red B. | |
| | Light and vivid | 9.2P 4.94/11.95 |
| | Dark and | 9.6P 4.70/10.9 |
| Dark series | | |
| | Dark and | grayish |
| | Dark and vivid | 8.4P 4.05/11.6 |
| | Dark and blue | 7.5P 4.32/10.5 |

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53(e).)

Note.—The Materials Transportation Bureau has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821 and OMB Circular A-107.

Issued in Washington, D.C., on June 23, 1977.

ALAN A. BUTCHMAN,
Acting Director,
Materials Transportation Bureau.

Note.—Incorporation by reference provisions approved by the Director of the Federal Register July 30, 1977, and a copy of the incorporated material filed in the Federal Register library.